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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/544,657

04/06/2000

James K. Waller JR.

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7590

08/23/2004

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EXAMINER

LAO, LUN S

ART UNIT

PAPER NUMBER

2643

DATE MAILED: 08/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/544,657

Applicant(s)

WALLER ET AL.

Examiner

Lun-See Lao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 April 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 16-18 and 22-25 is/are allowed.
- 6) ☒ Claim(s) 1-5, 7, 8, 10, 11, 13, 14 and 19-21 is/are rejected.
- 7) ☒ Claim(s) 6, 9, 12 and 15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Introduction

1. Claim 1-25 of U.S. application 09/544,657 filed on 04/06/2000 are presented for examination.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference character(s) mentioned in the description: fig.1, (9L and 9R) are missing (see specification (page 8 line 2)). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. *Claim Rejections - 35 USC § 112*

4. Claim 10 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not

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described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The subtracting " the right and left high frequency band signals from the left and right surround channel outputs when the summed high frequency band signal is dominant" (see specification page 5 lines 1-2 and page 18 lines 3-20) was not described in the further detail in the specification nor in any of claim.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-2 are rejected under 35 U.S.C. 102(e) as being anticipated by Cowieson (US PAT.6,198,826).

Consider claim1, Cowieson teaches a process for dynamically decoding two channel stereo into multi-channel sound comprising the steps of:

feeding left and right input signals (see fig.2, 11,12) to left and right front and surround channel outputs (31,41, 42, 32, 51, 52), respectively;

summing the left and right input signals (33, 45, 46, 36, 53) to provide a summed signal;

determining (by Q filter, 34, 43, 44) when the summed signal is dominant; and
subtracting (33, 35, 36, 45, 46) the right and left input signals from the left and right
surround channel outputs (31, 41, 42, 32, 51, 52), respectively, when the summed
signal is dominant (see col.2 line 59-col.3, line 47 and col.4 line 24-43).

Consider claim 2, Cowieson teaches a process of further comprising the step of
feeding the summed signal (see fig.2, 53) to a center front channel output (51 and col.5
lines 29-40).

(b) the invention was patented or described in a printed publication in this or a foreign country or in public
use or on sale in this country, more than one year prior to the date of application for patent in the United
States.

7. Claims 1-2 are rejected under 35 U.S.C. 102(b) as being anticipated by Waller
(US PAT.5,771,295).

Consider claim 1, Waller teaches a process for dynamically decoding two channel
stereo into multi-channel sound comprising the steps of:

feeding left and right input signals (see fig.1, L, R) to left and right front and
surround channel outputs (Lo, Ro, Co, L_{RO}, R_{RO}), respectively;

summing the left and right input signals (20,30) to provide a summed signal;

determining (80) when the summed signal is dominant; and

subtracting (30) the right and left input signals from the left and right surround
channel outputs (Lo, Ro, Co, L_{RO}, R_{RO}), respectively, when the summed signal is
dominant (see col.3 line 42-col.4, line 45).

Consider claim 2, Waller teaches a process of further comprising the step of feeding the summed signal (see fig.1, 20) to a center front channel output (Co and col.3 lines 42-59).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 3 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Waller (US PAT 5,771,295) in view of Aylward (US PAT 6,711,266).

Consider claims 3 and 21, Waller does not clearly teach a process of further comprising the step of differencing the right and left input signals to provide a center surround signal at a center surround channel output.

However, Aylward teaches a process of further comprising the step of differencing (see fig.15, 213) the right and left input signals (LT and RT) to provide a center surround signal at a center surround channel output (707, by located such as left out, right out, (front) center out, and surround out (back center surround out).

Therefore; it would have obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching Waller into Ayward to provide improved apparatus and techniques for encoding and decoding surround sound signals.

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10. Claims 4-5 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Waller (US PAT 5,771,295).

Consider claim 4, Waller teaches a process for dynamically decoding two channel stereo into multi-channel sound comprising the steps of:

feeding left and right input signals (see fig.1, 9R, 9L) to left and right front and surround channel outputs (Lo, Co, Ro, L_{RO}, R_{RO}), respectively;

summing (see fig.1, (20, 30)) the left and right input signals to provide a summed signal;

determining (see fig.1, 80) when the summed signal is dominant; and

subtracting (see fig.1, 30) the left and right filtered signals from the right and left surround channel outputs (Lo, Co, Ro, L_{RO}, R_{RO}), respectively, when the summed signal is dominant (see col.3 line 42-col.4 line 45); but fig.1 fails to teach filtering the left and right input signals over a preselected bandwidth to provide left and right filtered signals.

However, fig.2 teaches a filtering (see fig.2, (82L, 82R, 90L, 90R)) the left and right input signals over a preselected bandwidth to provide left and right filtered signals (see col.3 line 60-col.4 line 6);

Therefore; it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching fig.1 into fig.2 to provide an enhancing surround sound system.

Consider claim 5, Waller teaches a process of further comprising the step of filtering (see fig.2, (84L, 84R, 92L, 92R)) the summed signal (see fig.1, 20) over the preselected

bandwidth to provide a center front signal at a center front channel output (see fig.1, Co and col.3 line 42-col.4 line 46).

Consider claim 19, Waller teaches a process for dynamically decoding two channel stereo into mufti-channel sound comprising the steps of:

feeding left and right input signals (see fig.1, 9L, 9R) to left and right front and surround channel outputs Lo and Ro), respectively;

inverting the left and right input signals (see figs, 6L 6R, L and R);

summing (see fig. (20, 30)) the left and right input signals to provide a summed signal;

determining (see fig.1, 80) when the summed signal is dominant (see col.3 lines 42-59); but Waller does not clearly teach adding the left and right inverted signals to the right and left surround channel outputs, respectively, when the summed signal is dominant. However, Waller does indicated adding (see figs. 6L, 6R, (46,66)) the left and right inverted signals to the right and left front (surround) channel outputs (Lo and Ro), respectively, when the summed signal is dominant (see col.7 line 49-col.8 line 41) and it is well known that replacing difference channels in the art, such as the channel from left and right front channel to left and right surround channel. Therefor it would be obvious that Waller's teaching in front left and right channel to using in to the left and right surround channel to provide a enhancing surround sound system.

Consider claim 20, Waller teaches a process of further comprising the step of feeding the summed signal (see fig.1, 20) to a center front channel output (Co and col.3 lines 42-59).

11. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Waller (US PAT 5,771,295) in view of Cowieson (US PAT 6,198,826).

Consider claim 7, Waller teaches a process for dynamically decoding two channel stereo into multi-channel sound comprising the steps of:

feeding left and right input signals (see fig.1, L, R) to left and right front and surround channel outputs (Lo, Co, Ro, L_{RO} , R_{RO}), respectively;

summing the left and right input signals (20,30) to provide a summed signal;

determining (80) when the summed signal is dominant (col.3 line 42-col.4 line 45);

But Waller does not clearly teach a dynamically filtering the left and right input signals over a preselected bandwidth to provide left and right dynamically filtered signals; and subtracting the left and right dynamically filtered signals from the right and left surround channel outputs, respectively, when the summed signal is dominant.

However, Cowieson teaches a dynamically filtering (Q filter) the left and right input signals over a preselected (scale) bandwidth to provide left and right dynamically filtered signals; and subtracting (see fig.2 (33,35, 36,45, 46)) the left and right dynamically filtered signals from the right and left surround channel outputs (41, 42), respectively, when the summed signal is dominant (see col.2 line 59-col.3 line 47).

Therefore; it would have obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching Waller into Cowieson to provide a multiple channel audio systems to utilize their multiple channel capabilities and playback four or more channels synthesized from input material recorded in two-channel stereo.

Consider claim 8, Cowieson teaches a process of further comprising the step of dynamically filtering the summed signal over the preselected bandwidth to provide a center front signal at a center front channel output (see fig.2, (51) and col.5 lines 29-40).

12. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Waller (US PAT 5,771,295) in view of Kwang (US PAT 4,905,284) and Klayman (US PAT. 6,718,039).

Consider claim 10, Waller teaches a process for dynamically decoding two channel stereo into multi-channel sound comprising the steps of:

splitting a left input signal and a right input signal (see fig.2, L, R) into left and right bass and high frequency band signals (82R, 82L and 90L, 90R), respectively;

summing (see fig.2, 85) the left and right high frequency band signals to provide a summed high frequency band signal;

determining (80) when the summed high frequency band signal is dominant;

subtracting (85) the right and left high frequency band signals from the left and right surround channel outputs when the summed high frequency band signal is dominant;

subtracting (85) the right and left high frequency band signals from the left and right high frequency band signals, respectively, when the summed high frequency band signal is dominant to provide left and right processed high frequency band signals (see col.3 line 42-col.4 line46); but Waller does not clearly teach a feeding the left and right high frequency band signals to left and right surround channel outputs, respectively; and combining the left bass band signal and the left processed high frequency band signal

and the right bass band signal and the right processed high frequency band signal to provide left and right front channel outputs, respectively.

However, Kwang teaches a feeding the left and right high frequency band signals (see fig. 2A, (40, 40')) to left and right surround channel outputs (86, 86' and 90, 90'), respectively (see col.5 line 59-col.6 line 25).

Therefore; it would have obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching Waller into Kwang to provide a enhancing surround sound system.

On the other hand, Klayman teaches a combining (see fig.5, 90, 92) the left bass band signal (low, frequency (80)) and the left processed high frequency band signal (84) and the right bass band signal (82) and the right processed high frequency band signal (86) to provide left and right front channel outputs (30,32), respectively (see col. 8 line 31-52).

Therefore, it would have obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching Waller into Klayman to provide a sophisticated and effective system for improving a sound image in an imperfect reproduction environment.

Consider claim 11, Waller teaches a process of further comprising the step of feeding the summed (see fig.1, 20) (L and R) frequency band signal to a center front channel output (Co), but Fig.1 fails to teaches filtering the summed high frequency band signal.

However, fig.2 teaches filtering (90L, 90R) the summed (93) high frequency band signal.

Therefore; it would have obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching fig.1 into fig.2 to provide a enhancing surround sound system.

13. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Waller (US PAT 5,771,295) in view of Klayman (US PAT. 6,718,039).

Consider claim 13, Waller teaches a process for dynamically decoding two channel stereo into multi-channel sound comprising the steps of:

Splitting (see fig.2, (82L, 82R, 90L, 90R)) a left input signal and a right input signal into left and right bass and high frequency band signals, respectively;

Filtering (see fig.2, (82L, 82R, 90L, 90R)) the left and right high frequency band signals over a preselected bandwidth to provide left and right filtered signals, respectively;

Summing (85,93) the left and right high frequency band signals to provide a summed high frequency band signal;

Determining (80) when the summed high frequency band signal is dominant (see col.4 line 47-col.5 line 43);

Subtracting (85,93) the right and left filtered signals from the left and right high frequency band signals, respectively, when the summed high frequency band signal is dominant to provide left and right processed signals at left and right surround channel

outputs (see col.4 lines 7-53), respectively, but Waller does not teaches clearly a combining the left bass band signal and the left processed signal and the right bass band signal and the right processed signal to provide left and right front output signals at left and right front channel outputs, respectively.

However, Klayman teaches a combining (see fig.5 (90, 92)) the left bass band signal (80) and the left processed signal (84) and the right bass band signal (82) and the right processed signal to provide left and right front output signals (86) at left and right front channel outputs (30,32), respectively (see col. 8 line 31-52).

Therefore, it would have obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching Waller into Klayman to provide a sophisticated and effective system for improving a sound image in an imperfect reproduction environment.

Consider claim 14, Waller teaches a process of further comprising the step of the summed (see fig.1, 20) L and R frequency band signal over the preselected bandwidth to provide a center front output signal at a center front channel output (Co); but Fig.1 fails to teaches filtering the summed high frequency band signal.

However, fig.2 teaches filtering (90L, 90R) the summed (93) high frequency band signal.

Therefore; it would have obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching fig.1 into fig.2 to provide a enhancing surround sound system.

Allowable Subject Matter

14. Claims 16-18 and 22-25 are allowed.

Claims 6, 9, 12, 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Waller (US PAT. 5,638,452), Fosgate (US PAT. 5,644,640), Embree (US PAT. 5,642,423) and Griesinger (US PAT. 5,870,480) are citing to show other related to dynamic spectral matrix surround system.

16. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to: (703) 872-9306

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao, Lun-See whose telephone number is (703) 305-2259. The examiner can normally be reached on Monday-Friday from 8:00 to 6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz, can be reached on (703) 305-4708.


Any inquiry of a general nature or relating to the status of this application or proceeding

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should be directed to the Technology Center 2600 whose telephone number is (703) 306-0377.

Lao, Lun-See
Patent Examiner
US Patent and Trademark Office
Crystal Park 2
(703305-2259)


DUC NGUYEN
PRIMARY EXAMINER